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The phase diagrams of the ferromagnet-superconductor trilayers in external magnetic field

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Abstract

We investigate the critical properties of asymmetrical trilayers F 1F2S and F1SF2 structures in an external parallel magnetic field. The different mutual orientations of the F layers magnetizations are examined. At this condition the triplet component of the superconducting condensate is arisen. Assuming that all F and S layers are dirty, we solve the boundary value problem for the Usadel function. Then we use Gor'kov's self-consistency equation and calculate the critical temperature for both trilayers as function of the F layers thicknesses in external magnetic field H. We predict the surprising appearance of re-entrant superconductivity with increasing magnetic field.

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